A Test Lab Techno Corp.

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MPE Report

Applicant	：	LANCOM Systems GmbH
Product Type	：	Mini PCIe module
Trade Name	：	LANCOM
Model Number	：	EW-7955MAC
Received Date	：	Feb. 18, 2019
Test Period	：	Mar. 13, 2019
Issue Date	：	Apr. 08, 2019
Test Specification	：	ANSI / IEEE Std.C95.1-1992 / IEEE Std. 1528-2013
		47 CFR § 2.1091
		47 CFR § 1.1310

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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4. This document may be altered or revised by A Test Lab Techno. Corp. personnel only, and shall be noted in the revision section of the document.

Approved By ： Edison Hu (Edison Hu)　　Tested By ： Kris Pan (Kris Pan)

Revision History

Rev.	Issue Date	Revisions	Revised By
00	Apr. 08, 2019	Initial Issue	Serene Yang

Contents

1. Description of Equipment under Test (EUT)

Applicant	LANCOM Systems GmbH Adenauerstr. 20/B2, Wuerselen, 52146, Germany			
Manufacturer	Edimax Technology Co., Ltd. No.278, Xinhu 1st Rd., Neihu Dist., Taipei City, Taiwan			
Product Type	Mini PCIe module			
Trade Name	LANCOM			
Model Number	EW-7955MAC			
FCC ID	U4Y-EW7955MAC			
Frequency Range	Operate Band			Frequency Range (MHz)
	IEEE 802.11a U-NII Band I			5180 - 5240
	IEEE 802.11ac / 802.11n 5 GHz 20 MHz U-NII Band I			5180 - 5240
	IEEE 802.11ac / 802.11n 5 GHz 40 MHz U-NII Band I			5190 - 5230
	IEEE 802.11ac 80 MHz U-NII Band I			5210
Antenna Information	ANT	Model	Type	Max. Gain (dBi)
	ANT-0/ANT-1/ANT-2/ANT-3	AT-25-A80355-B32D083	External Antenna	5.00
	ANT-0/ANT-1/ANT-2/ANT-3	TE-2118837-2	PIFA Antenna	3.93
Antenna Delivery	IEEE 802.11a: 4TX (CDD) IEEE 802.11ac 20 MHz / 40 MHz / 80 MHz: 4TX (CDD/Beamforming on)			
RF Evaluation	0.223 mW/cm^2			
Temperature Range	0 ~ +50°C			

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1091 / 47 CFR § 1.1310. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties

2. Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR § 1.1310 titled “Radiofrequency radiation exposure limits”, generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as “a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter’s radiating structure(s) and the body of the user or nearby persons. ” This product is intended to be installed into a vehicle such that the unit is physically secured at one location. In the installation guide supplied with the product,

Client has made the following statement: “IMPORTANT: To meet the FCC’s RF Exposure Guidelines, the antenna should be installed so there is at least 20 cm of separation between the body of the user and nearby persons and the antenna”. Based on the installation of the transceiver and the antenna, the transmitters radiating structure is more than 20 cm from the user. Thus, this product is a “mobile device” as defined in section § 2.1091 paragraph (b).

Exposure evaluation
$$S = \frac{PG}{4\pi R^2}$$ Where S: power density P: power input to the antenna G: power gain of the antenna in the direction of interest relative to an isotropic radiator. R: distance to the center of radiation of the antenna.

3. RF Output Power

The conducted power turn-up tolerance reference manufacturer specification.

Band	Date Rate (Mbps)	Frequency (MHz)	Average Conducted power (dBm)				
			ANT-0	ANT-1	ANT-2	ANT-3	ANT-0+1+2+3
IEEE 802.11a	6	5180.0	16.42	15.93	16.15	15.58	22.05
		5200.0	16.50	16.11	16.36	15.41	22.14
		5220.0	16.61	16.23	16.32	15.45	22.19
		5240.0	**16.73**	16.36	16.55	15.51	22.33
IEEE 802.11ac 20 MHz	26	5180.0	17.14	16.71	16.76	16.18	22.73
		5200.0	17.32	16.80	16.93	16.06	22.82
		5220.0	**17.41**	16.98	16.96	16.13	22.91
		5240.0	17.40	16.99	17.04	16.34	22.98
IEEE 802.11ac 40 MHz	54	5190.0	14.03	13.65	13.83	13.29	19.73
		5230.0	**19.61**	18.89	19.04	18.35	25.02
IEEE 802.11ac 80 MHz	117.2	5210.0	**11.20**	10.71	10.91	10.37	16.83

Beamforming on

Band	Date Rate (Mbps)	Frequency (MHz)	Average Conducted power (dBm)				
			ANT-0	ANT-1	ANT-2	ANT-3	ANT-0+1+2+3
IEEE 802.11ac 20 MHz	26	5180.0	10.73	10.50	10.33	9.70	16.35
		5200.0	10.88	10.39	10.62	9.61	16.42
		5220.0	11.01	10.48	10.55	9.68	16.48
		5240.0	**11.05**	10.55	10.81	9.97	16.63
IEEE 802.11ac 40 MHz	54	5190.0	7.89	7.31	7.03	7.07	13.36
		5230.0	**12.94**	12.36	12.48	11.82	18.44
IEEE 802.11ac 80 MHz	117.2	5210.0	**4.52**	4.05	4.00	3.66	10.09

Note:1. The relevant measured result has the offset with cable loss already.

4. Test Results

WLAN Antenna__CDD										
Band	Data Rate (Mbps)	Frequency (MHz)	Limit (mw)	Distance [R] (cm)	Max tune-up Power (upper limit) [P] (dBm)	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	Power with Duty cycle [TP] (mW)	Power Density [S] (mw/cm^2)
IEEE 802.11a	6	5180.0	1	20	22.5	5.00	3.16	1	561.94	0.112
		5200.0	1	20	22.5	5.00	3.16	1	561.94	0.112
		5220.0	1	20	22.5	5.00	3.16	1	561.94	0.112
		5240.0	1	20	22.5	5.00	3.16	1	561.94	0.112
IEEE 802.11ac 20 MHz	26	5180.0	1	20	23.5	5.00	3.16	1	707.44	0.141
		5200.0	1	20	23.5	5.00	3.16	1	707.44	0.141
		5220.0	1	20	23.5	5.00	3.16	1	707.44	0.141
		5240.0	1	20	23.5	5.00	3.16	1	707.44	0.141
IEEE 802.11ac 40 MHz	54	5190.0	1	20	25.5	5.00	3.16	1	1121.21	0.223
		5230.0	1	20	25.5	5.00	3.16	1	1121.21	0.223
IEEE 802.11ac 80 MHz	117.2	5210.0	1	20	17.0	5.00	3.16	1	158.38	0.032

WLAN Antenna_Beamforming on										
Band	Data Rate (Mbps)	Frequency (MHz)	Limit (mw)	Distance [R] (cm)	Max tune-up Power (upper limit) [P] (dBm)	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	Power with Duty cycle [TP] (mW)	Power Density [S] (mw/cm^2)
IEEE 802.11ac 20 MHz	19.5	5180.0	1	20	17	11.02	12.65	1	634.00	0.126
		5200.0	1	20	17	11.02	12.65	1	634.00	0.126
		5220.0	1	20	17	11.02	12.65	1	634.00	0.126
		5240.0	1	20	17	11.02	12.65	1	634.00	0.126
IEEE 802.11ac 40 MHz	40.5	5190.0	1	20	19	11.02	12.65	1	1004.83	0.200
		5230.0	1	20	19	11.02	12.65	1	1004.83	0.200
IEEE 802.11ac 80 MHz	87.9	5210.0	1	20	10.5	11.02	12.65	1	141.94	0.028

Note:

1. Mobile or fixed location transmitters, minimum separation distance is 20 cm, even if calculations indicate MPE distance is less.
2. The Numeric Gain calculated by 10^(ant. Gain(dBi) /10).
3. Each band max power which perform MPE of any configurations.
4. The MPE results are evaluated by lowest data rate for WLAN.
5. The device operating IEEE 802.11 a mode is 4TX CDD.
6. The device operating IEEE 802.11 ac mode is 4TX MIMO / CDD.